

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 September 2003 (12.09.2003)

PCT

(10) International Publication Number
WO 03/074846 A1

(51) International Patent Classification⁷: **F01N 3/01**, 3/021, 03/033, 3/035, 3/031

(21) International Application Number: **PCT/GB03/00854**

(22) International Filing Date: **3 March 2003 (03.03.2003)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
0204928.6 1 March 2002 (01.03.2002) **GB**
0204929.4 1 March 2002 (01.03.2002) **GB**
0216302.0 13 July 2002 (13.07.2002) **GB**

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): **PER-TEC LIMITED** [GB/GB]; Manchester School of Engineering, The University of Manchester, Simon Building, Oxford Road, Manchester M13 9PL (GB).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **KUKLA, Peter** [GB/GB]; Per-Tec Limited, Manchester School of Engineering, The University of Manchester, Simon Building, Oxford Road, Manchester M13 9PL (GB).

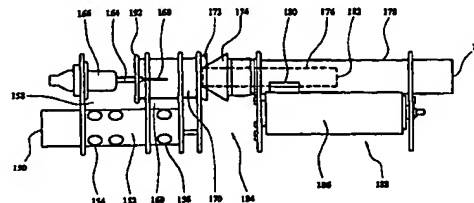
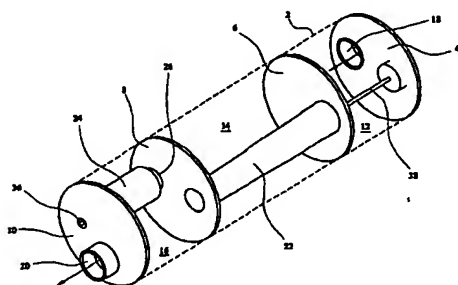
(74) Agents: **NEILL, Alastair, William et al.**; Appleyard Lees, 15 Clare Road, Halifax HX1 2HY (GB).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **IMPROVEMENTS IN AND RELATING TO GAS FLOW ARRANGEMENT APPARATUS AND TO APPARATUS FOR REMOVING POLLUTANTS FROM GAS STREAMS**



(57) Abstract: There is disclosed a gas flow arrangement apparatus comprising a gas entrance (18) and a gas exit (20), a first flow path from the gas entrance to the gas exit through a means (24) for at least partly removing at least one pollutant from a gas flow stream and second flow path from the gas entrance to the gas exit other than through the removing means (24).

WO 03/074846 A1

INTERNATIONAL SEARCH REPORT

Int'l Application No

PCT/G 3/00854

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F01N3/01 F01N3/021 F01N3/033 F01N3/035 F01N3/031

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 367 587 A (KAMMEL REFAAT A) 9 May 1990 (1990-05-09) column 2, line 29-31,40-45 column 3, line 53-55 column 4, line 4-7,9,10,18-21,38-41 column 6, line 45-48 column 8, line 55 -column 9, line 4 column 11, line 53 -column 12, line 8; figures 1,7,11	1,14,45, 47,75
X	US 4 871 515 A (REICHLE ERNST-MICHAEL ET AL) 3 October 1989 (1989-10-03) column 1, line 51,52,58-63 column 2, line 43,63-66 column 6, line 21,22,26 column 7, line 7-15,21-32,34-57; figures 3-5	1,14,45, 47,75

	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

9 July 2003

Date of mailing of the international search report

16/07/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Boye, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GP 3/00854

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 125 704 A (NGK INSULATORS LTD) 22 August 2001 (2001-08-22) column 11, line 16-26 column 21, paragraph 87 column 26, paragraph 105; figure 21 ----	1, 14, 45, 47, 75
X	EP 1 101 907 A (ISUZU CERAMICS RES INST CO LTD) 23 May 2001 (2001-05-23) column 2, line 26-34 column 3, line 31-33 column 6, line 14, 15 column 8, line 2-4; figure 1 ----	1-5, 7, 11-14, 37-44
X	WO 00 50745 A (JOHNSON MATTHEY PLC ; WINDAWI HASSAN (US)) 31 August 2000 (2000-08-31) page 2, paragraph 5 page 3, paragraph 3 page 5, paragraph 2; figures 1, 2 ----	1-5, 7-9, 11
X	US 4 441 971 A (ISHIGURO TOMOJI ET AL) 10 April 1984 (1984-04-10) column 3, line 1, 2, 21, 25, 30, 33-39, 45, 46, 64-68 column 4, line 1-4 column 6, line 3, 4; figures 3, 4 ----	1, 14, 45, 47, 75
A	WO 01 81735 A (KUKLA PETER ; TEC LTD (GB)) 1 November 2001 (2001-11-01) page 2, line 16-18, 25, 26; figures 1, 3 page 3, paragraphs 2, 4 page 7, line 21-29 page 8, paragraph 2 ----	1, 14, 45, 47, 75
A	FR 2 798 303 A (TEBOUL DANIEL) 16 March 2001 (2001-03-16) page 2, line 4, 5, 8-10, 16, 29-31 page 3, line 8 page 4, line 20 page 5, line 11, 23 page 9, line 3, 4, 10-15; figures 1, 2 ----	1, 14, 45, 47, 75
A	EP 0 411 445 A (CUMMINS ENGINE CO INC) 6 February 1991 (1991-02-06) abstract; figures 2, 3 -----	1, 14

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GP/8/00854

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0367587	A	09-05-1990	US 4969328 A CA 2001226 A1 DE 68921545 D1 EP 0367587 A2 US 5097665 A US 5121601 A	13-11-1990 01-05-1990 13-04-1995 09-05-1990 24-03-1992 16-06-1992
US 4871515	A	03-10-1989	DE 3723544 A1 EP 0299197 A2 JP 1047463 A	26-01-1989 18-01-1989 21-02-1989
EP 1125704	A	22-08-2001	CA 2347376 A1 EP 1125704 A1 CN 1327410 T WO 0115877 A1	08-03-2001 22-08-2001 19-12-2001 08-03-2001
EP 1101907	A	23-05-2001	JP 2000073739 A EP 1101907 A1	07-03-2000 23-05-2001
WO 0050745	A	31-08-2000	AU 2451200 A EP 1153206 A1 WO 0050745 A1 JP 2002537965 A	14-09-2000 14-11-2001 31-08-2000 12-11-2002
US 4441971	A	10-04-1984	JP 1013891 B JP 1539405 C JP 56047618 A JP 1046173 B JP 1564180 C JP 56045750 A DE 3035206 A1	08-03-1989 16-01-1990 30-04-1981 06-10-1989 12-06-1990 25-04-1981 09-04-1981
WO 0181735	A	01-11-2001	AU 4860901 A WO 0181735 A1	07-11-2001 01-11-2001
FR 2798303	A	16-03-2001	FR 2798303 A1 AU 7526200 A BR 0013978 A CA 2384755 A1 CN 1373689 T EP 1212141 A1 WO 0119525 A1 JP 2003509615 T	16-03-2001 17-04-2001 07-05-2002 22-03-2001 09-10-2002 12-06-2002 22-03-2001 11-03-2003
EP 0411445	A	06-02-1991	US 5063736 A DE 69021803 D1 DE 69021803 T2 EP 0411445 A2 JP 1952487 C JP 3081513 A JP 6080292 B	12-11-1991 28-09-1995 18-01-1996 06-02-1991 28-07-1995 05-04-1991 12-10-1994